Abstract of the Disclosure

An optical instrument using a plurality of lasers of different colors with parallel, closely spaced beams to stimulate scattering and fluorescence from fluorescent biological particulate matter, including cells and large molecules. A large numerical aperture objective lens collects fluorescent light while maintaining spatial separation of light stimulated by the different sources. The collected light is imaged into a plurality of fibers, one fiber associated with each optical source, which conducts light to a plurality of arrays of detectors, with each array associated with light from one of the fibers and one of the lasers. A detector array has up to ten detectors arranged to separate and measure colors within relatively narrow bands by decimation of light arriving in a fiber. A large number of detectors is mounted in a compact polygonal arrangement by using reflective transfer legs from multiple beam splitters where the transfer legs arise from a polygonal arrangement of beam splitters in a circumference within the circumferential arrangement of detectors.